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**(19) AUSTRALIAN PATENT OFFICE**

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**(10) Patent No. 632420**

**(54) Title**  
**Winch driven irrigator**

**(51) International Patent Classification(s)**  
**A01G 025/09 B05B 003/18**

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**(71) Applicant(s)**  
**Southern Cross Machinery (Australia) Pty. Limited**

**(54) Inventor(s)**  
**Ian Smith**

COMMONWEALTH OF AUSTRALIA

Patents Act 1952

APPLICATION FOR A STANDARD PATENT

We, SOUTHERN CROSS CORPORATION LIMITED, a company incorporated under the laws of the State of Queensland, of 259 Ruthven Street, Toowoomba, Queensland, 4350, Australia, hereby apply for the grant of a standard patent for an invention entitled:

"WINCH DRIVEN IRRIGATOR"


which is described in the accompanying complete specification.

Our address for service is:

HALFORD & CO  
Patent & Trade Mark Attorneys  
49-51 York Street  
SYDNEY NSW 2000

DATED this 26th day of April, 1991.

SOUTHERN CROSS CORPORATION  
LIMITED  
By their Patent Attorneys  
HALFORD & CO



To: The Commissioner of Patents  
Fee: \$150.00  
File: C 91 027

SO21421 26/04/91

C91027

632420

AUSTRALIA

Patents Act 1990

**NOTICE OF ENTITLEMENT**

(To be filed before acceptance)

We, Southern Cross Corporation Limited, of 259 Ruthven ~~XXXX~~ Street  
Toowoomba, Queensland, 4350, Australia, being the applicant in  
respect of Application No. 75974/91, state the following:-

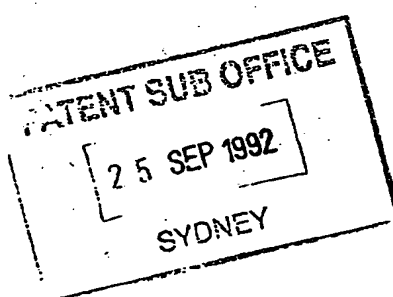
The person nominated for the grant of the patent has entitlement  
from the actual inventor, Ian Smith, of 259 Ruthven ~~XXXX~~ Street  
Toowoomba, Queensland, by assignment.

  
K.R. MASSEY

Finance and Administration Manager

15 September, 1992

(Date)



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(12) PATENT ABRIDGMENT (11) Document No. AU-B-75974/91  
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 632420

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- (54) Title  
WINCH DRIVEN IRRIGATOR
- International Patent Classification(s)  
(51)<sup>5</sup> A01G 025/09 B05B 003/18
- (21) Application No. : 75974/91 (22) Application Date : 26.04.91
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- (71) Applicant(s)  
SOUTHERN CROSS CORPORATION LIMITED
- (72) Inventor(s)  
IAN SMITH
- (74) Attorney or Agent  
HALFORD & CO. , 9th Floor, 49-51 York Street, SYDNEY NSW 2000
- (56) Prior Art Documents  
AU 413961 14335/66 A01G 25/09  
AU 73761/74 A01G 25/09  
AU 146966 31618/49 A01G 25/09

(57) Claim

1. A travelling irrigator, comprising:

a frame adapted for movement over ground to be irrigated;

a water inlet for connection to a supply of irrigation water;

a water sprinkler for distributing the water about the irrigator;

drive means for driving rotation of a first drive gear; and

a cable winch drum mounted for rotation about its axis, said drum having a second drive gear which is engageable with the first drive gear for winching cable onto the drum;

wherein the drum is moveable relative to the drive means between a first position in which the first and second gears are engaged and a second position in which the first and second gears are not engaged.



632420

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Form 10

PATENTS ACT 1952

# COMPLETE SPECIFICATION

(ORIGINAL)

FOR OFFICE USE

Short Title:

Int. Cl:

Application Number:  
Lodged:

Complete Specification—Lodged:  
Accepted:  
Lapsed:  
Published:

Priority:

Related Art:

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TO BE COMPLETED BY APPLICANT

Name of Applicant: SOUTHERN CROSS CORPORATION LIMITED

Address of Applicant: 259 Ruthven Street  
Toowoomba QLD 4350

Actual Inventor:

Address for Service: HALFORD & CO  
Patent & Trade Mark Attorneys  
49-51 York Street  
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Complete Specification for the invention entitled: WINCH DRIVEN IRRIGATOR

The following statement is a full description of this invention, including the best method of performing it known to me:—

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The present invention relates to a travelling irrigator of the type having a cable winch which draws the irrigator along its run as the irrigator is operated. In particular, the invention relates to an improved construction for allowing withdrawal of the cable prior to the run.

In prior art irrigators of the reaction drive type, in which a set of rotating sprinkler arms are caused to rotate by the reaction force of the water being distributed, the rotation of the sprinkler arms is transferred to the cable winch via a series of gears. These gears include a worm which drives a worm gear mounted on the shaft of the cable drum, with the worm gear driving the drum through a shear pin which passes through the worm gear and a flange on the cable drum. In order to withdraw the cable prior to the run, one disengages the shear pin to allow free rotation of the cable drum while the worm gear remains engaged with the worm.

The present invention aims to provide a simpler and quicker cable withdrawal mechanism.

The present invention thus provides a travelling irrigator, comprising:

a frame adapted for movement over ground to be irrigated;

a water inlet for connection to a supply of irrigation water;

a water sprinkler for distributing the water about the irrigator;

drive means for driving rotation of a first drive

gear; and

5 a cable winch drum mounted for rotation about is  
axis, said drum having a second drive gear which is  
engageable with the first drive gear for winching  
cable onto the drum;

10 wherein the drum is moveable relative to drive means  
between a first position in which the first and  
second gears are engaged and a second position in  
which the first and second gears are not engaged.

15 Preferably, the drum is mounted for rotation about a  
spindle which is moveable relative to the frame and  
the drive means. More preferably, the spindle is  
mounted for part rotation about an offset axis, thus  
moving the drum between its first and second  
positions.

20 Preferred embodiments of the present invention shall  
now be further described with reference to the  
accompanying drawings, in which:

25 Fig. 1 is an exploded view of part of a prior art  
travelling irrigator; and

30 Figs. 2 and 3 are schematic plan views of the worm  
gear and cable drum arrangement of an irrigator of the  
present invention in the first and second positions  
respectively.

35 The prior art irrigator of Fig. 1 includes a frame 11  
supported on wheels 12. A water inlet connector 13 is  
provided for connection to a water supply hose (not  
shown), and the water passes up through tube 14 and  
into a pair of bent sprinkler booms 15. The reaction  
force of the water passing through the booms causes

the booms and tube 15, which is journalled for rotation, to rotate. This rotation is transferred via gears 16, 17 to a drive shaft 18 with a drive worm 19 thereon.

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The cable drum 20 is fixed to a shaft 21, and has a pair of end flanges 22a, 22b for restraining the cable 23 wound thereon. The shaft is mounted on the frame via bearings 24, and carries a worm gear 25 mounted for rotation independent of the shaft 21 and cable drum 20.

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The worm gear 25 is permanently engaged with the drive worm 19 such that the rotation of the worm causes rotation of the worm gear about shaft 21. If the spring-loaded shear pin 26 is inserted through corresponding holes 27a, 27b in the worm gear 25 and the end flange 22a of the drum, the cable drum is also rotated, thus winding the cable 23 onto the drum 20. In use, the far end of the cable will be fixed to a fixed object, and the irrigator will be winched along as the cable is wound in.

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Worm drives of this nature are self locking, and so it is necessary to disengage shear pin 26 to pull out the cable in preparation for an irrigation run. To commence the irrigation run, the holes 27a and 27b are aligned and the shear pin is inserted. The water supply is then turned on.

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A preferred irrigator of the present invention has a wheeled frame, water inlet and sprinkler arrangement similar to that shown in Fig. 1. However, as illustrated in Figs. 2 and 3, the worm gear 125 forms one end flange of the cable drum 120, which is mounted for rotation about the axis 128 of spindle 129. The end of the spindle nearest the worm gear is secured to

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the frame by a retaining bolt 130 offset from the axis 128. The other end of the spindle protrudes through the frame and has an actuating lever 131.

5       Rotation of the spindle through 90° by the lever moves  
the spindle axis 128, and therefore the cable drum  
between a driving position (Fig. 2) and a cable  
withdrawal position (Fig. 3). In the driving  
10       position, the worm gear 125 is engaged with the drive  
worm 119, which may be mounted directly on the  
sprinkler tube for simplicity. Thus, rotation of the  
sprinkler booms and tube winds the cable 123 onto the  
drum 120 to winch the irrigator along. In the cable  
15       withdrawal position, the worm gear 125 is disengaged  
from the worm 119. This allows free rotation of the  
cable drum about the spindle as the cable is  
withdrawn. The angle of the spindle in Fig. 3 has  
been accentuated for clarity.

20       Thus, the arrangement of the present invention  
provides a simple mechanism for allowing withdrawal of  
the cable in preparation for an irrigation run.

25       While particular embodiments of this invention have  
been described, it will be evident to those skilled in  
the art that the present invention may be embodied in  
other specific forms without departing from the  
essential characteristics thereof. The present  
embodiments and examples are therefore to be  
30       considered in all respects as illustrative and not  
restrictive, the scope of the invention being  
indicated by the appended claims rather than by the  
foregoing description, and all changes which come  
within the meaning and range of equivalency of the  
35       claims are therefore intended to be embraced therein.

**CLAIMS**

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A travelling irrigator, comprising:

a frame adapted for movement over ground to be irrigated;

a water inlet for connection to a supply of irrigation water;

a water sprinkler for distributing the water about the irrigator;

drive means for driving rotation of a first drive gear; and

a cable winch drum mounted for rotation about its axis, said drum having a second drive gear which is engageable with the first drive gear for winching cable onto the drum;

wherein the drum is moveable relative to the drive means between a first position in which the first and second gears are engaged and a second position in which the first and second gears are not engaged.

2. An irrigator according to claim 1 wherein the drum axis is movable relative to the drive means.

3. An irrigator according to claim 2 wherein the drive means is actuatable by the irrigation water.

4. An irrigator according to claim 3 wherein the sprinkler is adapted to rotate due to the reaction force of the irrigation water, and said drive means comprises means for transferring the rotation of the



sprinkler into rotation of the first gear.

5. An irrigator according to claim 2 or 4 wherein the first gear is a worm and the second gear is a corresponding worm gear.

6. An irrigator according to claim 5 wherein the second gear comprises a flange on the cable drum.

7. An irrigator according to claim 2 wherein the cable drum is mounted for rotation about a spindle which is movable relative to the frame.

8. An irrigator according to claim 7 wherein the spindle is mounted for at least part rotation about an axis which is offset from the axis of rotation of the drum.

9. An irrigator according to claim 8 wherein the spindle is rotatable between first and second orientations in which the drum is in its first and second positions respectively.

10. An irrigator according to claim 9 further comprising a lever attached to the spindle for rotating the spindle between the first and second orientations.

11. A travelling irrigator substantially as herein described with reference to Figures 2 and 3.

DATED this 24th day of September 1992.

SOUTHERN CROSS CORPORATION LIMITED  
By their Patent Attorneys  
HALFORD & CO



# DRAWINGS

75974/91

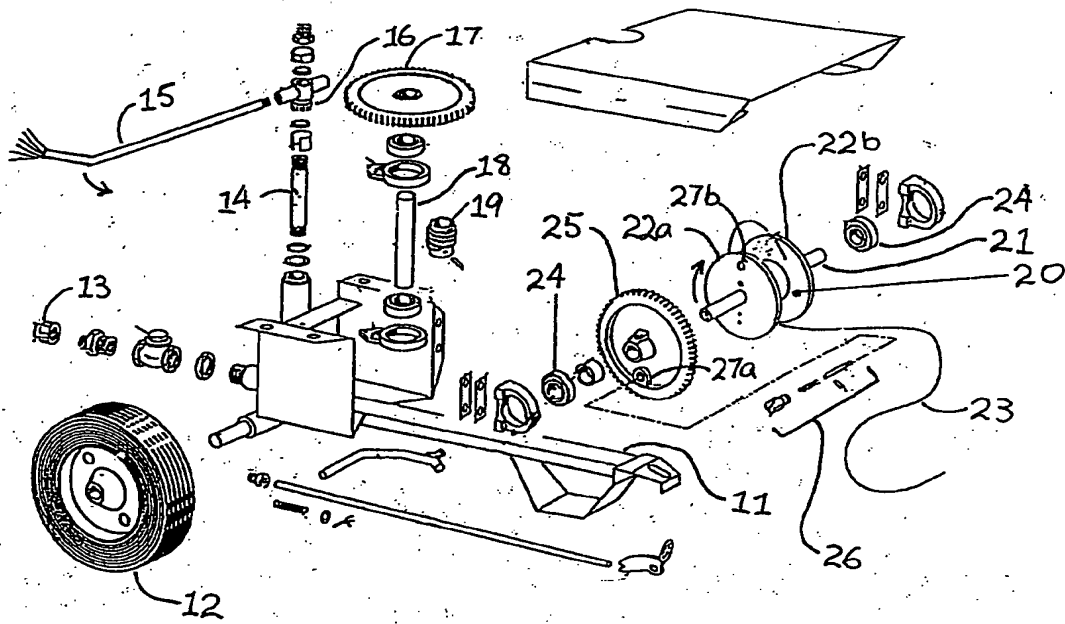


Fig. 1

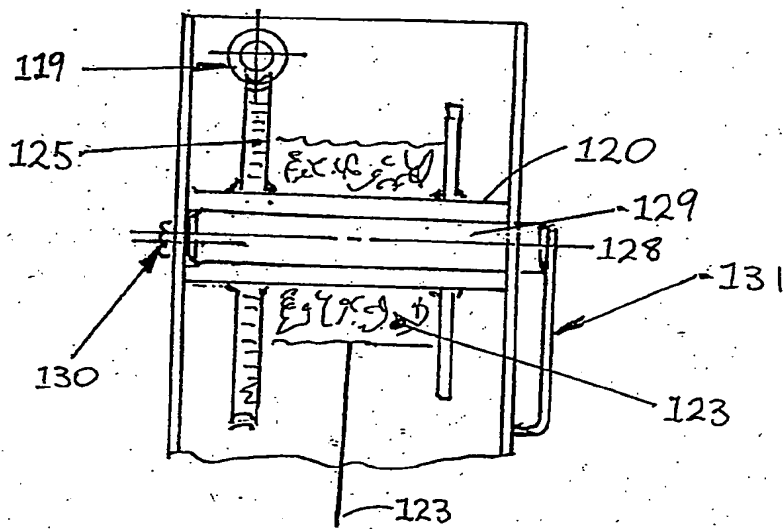


Fig. 2

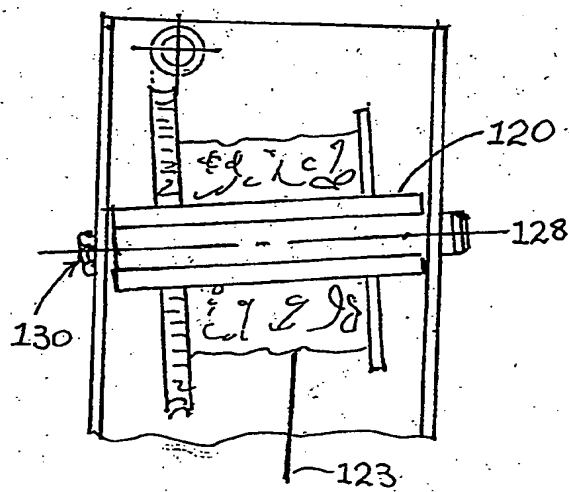


Fig. 3